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May 2, 2008

Ms. Fran Kammerer
Staff Counsel
Office of Environmental Health Hazard Assessment
1001 I Street
Sacramento, CA 95812

Subject: Request for Public Participation, Notice of Public Workshop - Proposition 65 Regulatory Update Project, Beneficial Nutrients Regulatory Concept [03/21/08]

Dear Ms. Kammerer:

I am submitting these comments on behalf of several of my clients, in response to the subject notice published by the Office of Environmental Health Hazard Assessment ("OEHHA" or the "Agency") on March 21, 2008. I appreciated the opportunity to participate in and make oral comments at the public workshop held on this subject in Sacramento on April 18, and herein I am summarizing my oral comments and providing additional explanatory comments.

I. The Concepts Described in the "Possible Regulatory Language" are not Based on Sound Scientific Principles and would not Serve the Public's Health.

I have reviewed the "Possible Regulatory Language" for the proposed new section of the regulations entitled "Exposure to Beneficial Nutrients in a Food" and have concluded that the concepts laid out are not based on sound toxicology or nutritional science principles. At the April 18 public workshop, I and several other participants presented our views on the meanings and intended uses of the various Dietary Reference Intakes (DRIs) published by the Institute of Medicine's Food and Nutrition Board (FNB). The DRIs were established as part of the FNB's 10-year effort (begun in 1994) to update and revise for each vitamin or element:

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(1) the recommended intake level [the "Recommended Dietary Allowance" or "RDA" or the "Adequate Intake" or "AI"]; and (2) the safe intake level [the "Tolerable Upper Intake Level" or "UL"]. Please note that the "Possible Regulatory Language" section (c) mistakenly calls the RDA the "Recommended Daily Allowance" instead of the "Recommended Dietary Allowance."

When the FNB was not able to precisely determine the exact quantitative daily requirement for a specific vitamin or element, they set instead an AI level, which is their best estimate of the daily requirement. Consequently, AIs were established for many essential nutrients, including vitamins D and K, calcium, chromium, manganese and potassium. RDAs, on the other hand, were set when the FNB was able to determine daily requirements more exactly, i.e., based on better data or less uncertainty. In addition, for each nutrient, the FNB tried to set a UL based on the best toxicology and risk assessment data available, but for several nutrients they were unable to determine a UL because of the paucity of data.

By definition, the RDA is a statistical estimate of a nutrient's daily requirement covering 97-98% of the healthy population, but it does not cover the needs of 100% of the population. The RDA is certainly not intended by the FNB as a "bright line" intake level that should never be exceeded, and the FNB even recognizes that levels higher than the RDAs are sometimes required for maintaining optimal health, especially for people with some diseases. In addition, there has been very extensive published research over the past decade demonstrating that some of the RDAs have been set too low. How would OEHHA deal with changes that will be coming when the FNB begins revising their RDAs, AIs and ULs in the coming years, which is their already stated plan, especially if various safe levels have been set by OEHHA based on the current levels? Under the regulatory scheme for beneficial nutrients now being considered by OEHHA, consumers may be receiving warnings under Proposition 65 that would then have to be rescinded by food manufacturers if FNB levels were raised.

Vitamin D is one of the best examples of this concept of the recommended intake level being set too low, and even some of the FNB DRI panel members who set the current daily requirement for vitamin D are among those calling for the recommended level to be increased.

Many medical, clinical and experimental nutrition experts have been calling for significant increases in other RDAs and AIs in order to better protect individuals from the initiation and progression of chronic diseases such as coronary heart disease, cancer and osteoporosis. Such calls for increased recommended intakes will far better serve the public's health than setting the current RDAs as intake levels not to be exceeded. For OEHHA to consider setting the RDA level for a listed nutrient as the "no exposure" level in foods, and then to consider intakes above the RDA as an "exposure" subject to Proposition 65 warnings to consumers, is a scientifically indefensible concept that must be avoided in the interests of public health. Why would OEHHA set the limit at the RDA when the RDA is not the threshold for safety?

Turning now to the consideration of the Upper Level or UL, I believe that OEHHA's proposed use of the UL as a benchmark for deciding that the daily intake of a listed nutrient exceeding 20% of the FNB's UL would require a warning to consumers, is also scientifically flawed and is not based on sound principles of toxicological science required under Proposition 65 regulations. The FNB's UL Subcommittee, a distinguished panel of academic, government and industry toxicologists, developed and employed risk assessment methodology for the nutrients that focussed on chronic intakes by various age and sex groups. Such chronic toxicity-based ULs may be appropriate in limited cases for listed carcinogens under Proposition 65, because lifetime average daily doses are the key determinants of possible carcinogenic responses under the regulations; however, ULs may not be appropriate for listed developmental toxicants, since the toxicity endpoints of concern are not affected by chronic intakes but instead by intakes during the course of a woman's pregnancy.

For the reasons cited above, then, the potential use of the FNB's RDAs and ULs as starting points for determining safe intake levels for listed nutrients under Proposition 65 lacks scientific merit and is actually counter productive to the optimization of the health of California consumers. In the event that any beneficial nutrient was being considered for listing under the statute, I strongly discourage OEHHA from using any of the specific DRI levels when setting safe intake levels under the Proposition 65 law and regulations.

II. The Specific Use of RDAs and ULs to Set Safe Levels of Intake for Listed Beneficial Nutrients is based on Scientifically Flawed Methodologies and is therefore not Scientifically Defensible.

I pointed out during my oral comments at the April 18 Public Workshop that the use of either the RDAs for some nutrients and ULs for non-RDA nutrients that may be listed by Proposition 65 leads to scientifically indefensibly results. Tables 1 and 2 (attached) summarize the RDAs, AIs and ULs for the FNB nutrients, as well as various ratios I calculated in order to support several important points. First of all, as defined above, the RDA was set for a nutrient if the FNB was able to determine its requirements for various age and sex groups more accurately based on the presence of good supporting data and the certainty of that data. When they were not sure of the exact requirements for a particular nutrient, such as calcium, vitamin D and others, they set instead a recommended AI level for the nutrient. Whether an RDA or AI was set for a nutrient, either way both are recommended dietary intake levels.

As you can see in Table 1 describing beneficial nutrients with RDA levels, many of the RDA nutrients have UL levels very much higher than the RDA levels (see the UL/RDA ratio column). Five of these ratios are even in the range of 22 to 67 times higher than the RDAs, two others are about 7 times higher and the remainder are in the range of 2 to 5 times higher. Looking at the right-hand column, the UL x 20% / RDA ratios, the first 9 nutrients listed all have RDAs lower than the UL x 20% value. But OEHHA is proposing to use the RDA levels of these nutrients as the safe level, instead of using the higher UL x 20% value. This has the effect of penalizing RDA nutrients down to a much lower safe level than would be achieved by using the UL-derived value. Therefore, using these RDA levels as the safe levels makes no scientific sense. Also in Table 1 you can see that iron, zinc, niacin and folate all have UL x 20% / RDA ratios less than 1.0. This means that if the UL-derived methodology had any scientific validity and was used for setting safe level for these nutrients, the safe level would be set lower than the RDA level, which is also not scientifically defensible or in the interest of public health.

In Table 2, I have listed levels for those beneficial nutrients for which the FNB has set AI levels, because more exact RDA levels could not be confirmed. As in Table 1, UL vs. AI ratios have also been calculated. The most important learning from Table 2 is that both calcium and fluoride have UL x 20% / AI ratios (right hand column) that are well below 1.0, meaning that the UL-derived methodology for these non-RDA nutrients would set a safe level significantly less than the recommended AI level. Surely this type of methodology cannot serve the health of California consumers well, since they would have to be warned to stay below the recommended intakes for calcium and fluoride. Furthermore, the last five AI nutrients in Table 2 do not have UL levels set by the FNB, so there would be no way to use the UL methodology to set levels for these nutrients.

III. Conclusions.

For the reasons I've outlined above, I urge OEHHA to drop consideration of this proposed regulatory scheme because it is not grounded in sound scientific principles. Using the RDAs as safe levels for those beneficial nutrients with established RDAs makes no scientific or public health sense, nor does the use of the UL methodology for those beneficial nutrients not having established RDA levels. The FNB and OEHHA are at cross purposes in their missions for evaluating substances. FNB established principles and guidelines for recommended and adequate dietary intakes of beneficial nutrients and renders authoritative judgments on the relationships among food intake, nutrition and health. In contrast, OEHHA evaluates hazardous substances for listing under Proposition 65 to require warnings about products containing substances on specific endpoints. Warnings are meant to scare people away from exposures, while the FNB serves to inform consumers about smart and healthful food and nutrient choices.

Thank for the opportunity to provide these comments. If you have any followup questions, please don't hesitate to contact me.

Sincerely,

James R. Coughlin, Ph.D.

cc (via email): Dr. Joan Denton
Ms. Carol Monahan-Cummings

Table 1. Beneficial Nutrients with Recommended Dietary Allowance (RDA) Levels.

Nutrient		RDA (adults)	UL	UL / RDA (Ratio)	UL x 20%	UL x 20% / RDA (Ratio)
Vitamin E	mg/d	15	1,000	66.7	200	13.3
Copper	µg/d	900	10,000	11.1	2,000	2.2
Molybdenum	µg/d	45	2,000	44.4	400	8.9
Iodine	µg/d	150	1,100	7.3	220	1.5
Vitamin B6	mg/d	1.3	100	76.9	20	15.4
Vitamin C	mg/d	M 90 / F 75	2,000	22.2 / 26.7	400	4.4 / 5.3
Phosphorus	mg/d	700	4,000	5.7	800	1.1
Selenium	µg/d	55	400	7.3	80	1.5
Iron	mg/d	M 8 / F 18	45	5.6 / 5.0	9	1.1 / 0.5
Zinc	mg/d	M 11 / F 8	40	3.6 / 5.0	8	0.7 / 1.0
Niacin	mg/d	M 16 / F 14	35	2.2 / 2.5	7	0.4 / 0.5
Folate	µg/d	400	1,000	2.5	200	0.5
Thiamine	mg/d	M 1.2 / F 1.1	ND	-	-	-
Riboflavin	mg/d	M 1.3 / F 1.1	ND	-	-	-
Vitamin B12	µg/d	2.4	ND	-	-	-

Table 2. Beneficial Nutrients with Adequate Intake (AI) Levels.

Nutrient		AI (adults)	UL	UL / AI (Ratio)	UL x 20%	UL x 20% / AI (Ratio)
Vitamin D	µg/d	5 – 10	50	5 - 10	10	1 - 2
Choline	mg/d	M 550 / F 425	3,500	6.4 / 8.2	700	M 1.3 / F 1.6
Manganese	mg/d	M 2.3 / F 1.8	11	4.8 / 6.1	2.2	M 1.0 / F 1.2
Calcium	mg/d	1,000 – 1,200	2,500	2.5 / 2.1	500	0.4 - 0.5
Fluoride	mg/d	M 4 / F 3	10	2.5 / 3.3	2	M 0.5 / F 0.7
Vitamin K	µg/d	M 120 / F 90	ND	-	-	-
Pantothenic acid	mg/d	5	ND	-	-	-
Biotin	µg/d	30	ND	-	-	-
Chromium	µg/d	20 - 35	ND	-	-	-
Potassium	g/d	4.7	ND	-	-	-